APPENDIX A

SOIL DEFINITIONS AND CHARACTERISTICS

Soil Descriptions and Characteristics

Soil Descriptions

- Alluvial land, sandy

  Alluvial land, sandy (AdA) consists of sandy and gravelly deposits along streams. Stratification is variable, and recent overwashes tend to change the texture of the surface layer from time to time. Streambank cutting and erosion have occurred in some locations. This land type is used for limited grazing and wildlife habitat. Capability unit VIIw-4.

- Atwell clay loam, 30 to 50 percent slopes

  This steep soil is on uplands. It is commonly in swales and draws on wooded hillsides. Included in mapping are areas of Hugo very gravelly loam and Hely silt loam. Small areas of soils having slopes less than 30 percent are also included. Permeability of the subsoil is very slow, and runoff is rapid. The hazard of erosion is high and slips are common. Fertility is moderate. The available water capacity is 9 to 11 inches. This soils is used for woodland and for recreation. Capability unit VIe-3; woodland group 8.

- Baywood loamy sand, 2 to 9 percent slopes

  This soil is on coastal benches. Most of the slopes are long and smooth. In most places the range in slope is from 2 to 5 percent. The texture ranges from sand to loamy sand. Included in mapping are small areas of Sheridan coarse sandy loam and Rohnerville loam. Also included are small localized areas of rock outcrops. Permeability is rapid. Runoff is very slow to slow, and the hazard of soil blowing is moderate. Fertility is low. The available water capacity is 4 to 5 inches. This soil is used mainly for pasture. Capability unit IIIe-4.

- Coastal beaches

  Coastal beaches is a miscellaneous land type which consists of narrow, sandy beaches that are covered or nearly covered during high tide and exposed during low tide. They occur where the rocky and sandy areas of the Pacific Ocean meet the Sonoma County coast. Parts of the coast consist of narrow beaches backed by bluffs that are 10 to 250 feet high. In some areas the bluffs rise abruptly from the sea. The beaches have no agricultural value but are used for recreation such as camping, picnicking, surf fishing, and clam and abalone hunting. Capability unit VIIIw-4.

- Dune land

  Dune land consists of loose, shifting sand. It is in many areas scattered along the coast. The largest area is on the coastal side of the north end of Bodega Head extending toward the mouth of Salmon Creek. Much dune grass has been planted in an effort to control

mass movement of the sand. Ocean winds have shifted the dunes. This shift has threatened agricultural land and possible homesites. Dune land is used mainly for recreational purposes. Capability unit VIIIe-4.

- Hugo very gravelly loam, 50 to 75 percent slopes

  This very steep soil is in mountainous uplands. Soil depth to weathered rock ranges from 30 to 60 inches. Included in mapping are small areas of Atwell clay loam, Josephine loam, Laughlin loam, and Maymen gravelly sandy loam. Also included are areas with up to 5 percent rock outcrops on the surface. Permeability is moderate in the subsoil of this Hugo soil. Runoff is very rapid, and the hazard of erosion is very high. Fertility is moderate. The available water capacity is 4 to 8 inches. This soil is used mainly for producing timber. Some areas that have been logged are used for grazing. Capability unit VIIe-4; woodland group 6.

- Hugo very gravelly loam, 30 to 50 percent slopes

  This soil is similar to Hugo very gravelly loam, 50 to 75 percent slopes, but it is not so steep. The gravel content varies from 25 to 45 percent by volume. Included in mapping areas are small areas of Josephine loam, Laughlin loam, and Maymen gravelly sandy loam. Runoff is rapid, and the hazard of erosion is high. The available water capacity is 4 to 8 inches. This soil is used mainly for timber. Capability unit VIe-4; woodland group 2.

- Hugo-Atwell complex, 30 to 50 percent slopes

  This complex is in the northern and western areas of the county on sandstone and shale of the Franciscan formation. It is also between Camp Meeker and north to the Russian River, where there is a large proportion of metamorphosed sandstone and shale. The Hugo soils make up about 70 percent of the complex; Atwell soils, about 20 percent; Melbourne soils, about 5 percent; and Josephine soils, the remaining 5 percent. Stoniness ranges from 15 to 30 percent. The Hugo soils have predominantly concave slopes while the Atwell soils have convex slopes and occur near water courses. Occasional landslips are common on Atwell soils. The quality of timber is lower on Atwell soils than on Hugo soils. The Hugo soil has a profile similar to the Hugo very gravelly loam, 50 to 75 percent slopes. Soil depth is 30 to 50 inches. Runoff is rapid, and the hazard of erosion is high. The available water capacity is 4 to 7.5 inches. The Atwell soil has a profile similar to Atwell clay loam, 30 to 50 percent slopes. Soil depth is 30 to 50 inches. Surface runoff is rapid, and the hazard of erosion is high. This soil is used mainly for timber. Capability unit VIe-4; Hugo, woodland group 2; Atwell, woodland group 8.

- Josephine loam, 9 to 30 percent slopes

  This soil ranges in depth from 36 to 60 inches, although much of the acreage is 45 inches deep or more. Content of stone and gravel ranges from none to 20 percent, by

volume. Included in mapping are small areas of Hugo very gravelly loam, Laughlin loam, and Mendocino sandy clay loam. Runoff is medium to rapid, and the hazard of erosion is moderate to high. The available water capacity is 6 to 10 inches. The main use of this soil is for timber. Attempts at growing orchards and vineyards have been generally unsuccessful. Capability unit IVe-1; woodland group 1.

- Kinman loam, 30 to 50 percent slopes

  This steep soil is on uplands. Most of the slopes are long and smooth. In most places, slopes range from 30 to 40 percent. Depth to rock varies from 30 to 55 inches. Some of the steeper slopes have old slip areas that are nearly stabilized. Included in mapping are small areas of Kneeland loam, Laughlin loam, Rohnerville loam, and Yorkville clay loam. Also included are scattered areas of large rock outcrops sometimes called "sea stacks." Permeability is slow in the subsoil of this Kinman soil. Runoff is rapid, and the hazard of erosion is high. Fertility is moderate. The available water capacity is 4.5 to 8 inches. This soil is used mainly for grazing by sheep and cattle. Capability unit VIe-3; range site 6.

- Kinman loam, 15 to 30 percent slopes

  This soil is similar to Kinman loam, 30 to 50 percent slopes, but the depth to bedrock is deeper. The surface layer and subsoil combined are about 40 to more than 60 inches thick. Included in mapping are small areas of Kneeland loam, Laughlin loam, and Yorkville clay loam. Also included are scattered areas of a dark-gray clay generally near the areas of the Yorkville series. Occassionally, there are outcrops of hard sandstone. Runoff is medium to rapid, and the hazard of erosion is moderate to high. The available water capacity is about 6 to 10 inches. The soil is used mainly for sheep pasture and for range. Capability unit VIe-3; range site 2.

- Kinman-Kneeland loams, 30 to 50 percent slopes

  This complex is above the coastal terraces between Bodega Bay and the vinicity of Jenner. Kinman loam makes up about 60 percent of the complex, and Kneeland loam about 40 percent. Included with these soils are areas of soils that hae slopes of less than 30 percent or greater than 50 percent. The lesser slopes usually occur on broad ridgetops. Rock outcrops cover less than 2 percent of the surface. Seepage is common on the lower toeslopes of the Kinman soils. Depth to sandstone and shale in Kinman loam is 30 to 45 inches. Runnoff is rapid, and the hazard of erosion is high. The available water capacity is 4.5 to 7.5 inches. Kneeland loam has a profile similar to that of Kneeland loam, 5 to 9 percent slopes. Depth to sandstone is 25 to 40 inches. Runoff is rapid, and the hazard of erosion is high. The available water capacity is 4 to 7 inches. These soils are used for range and pasture. Capability unit VIe-3; Kinman, range site 6; Kneeland, range site 12.

- Kneeland loam, 5 to 9 percent slopes

  This is gently sloping to moderately sloping soil is on upland ocean terraces. Included in mapping are scattered areas of sandstone outcrops and small areas of Kinman loam and Steinbeck loam. Permeability is moderate in the subsoil of this Kneeland soil. Runoff is slow, and the hazard of erosion is slight. Fertility is moderately low, and the available water capacity is 4 to 8 inches. The effective rooting depth is 25 to 45 inches. This soil is used mainly for range and pasture. Capability unit IIIe-1; range site 12.

- Kneeland loam, 30 to 50 percent slopes

  This soil is similar to the Kneeland loam, 5 to 9 percent slopes. It generally is about 25 inches deep, but at times it is 40 inches deep. Included in mapping are small areas of Kinman loam, Los Osos clay loam, and Steinbeck loam. Runoff is rapid, and the hazard of erosion is high. This soil is used mainly for range, for sheep grazing. Capability unit VIe-1; range site 12.

- Kneeland rocky complex, 30 to 75 percent slopes

  Rock outcrops or "sea stacks," scattered throughout the fields, occupy about 15 to 20 percent of the surface area of this complex. Sea stacks are remnant, weather-resistant, fine-grained sandstone that rise above the surface. The remaining 80 to 85 percent of these areas consists of Kneeland loam. Occasionally there are stone in the subsoil. Runoff is very rapid, and the hazard of erosion is very high. Kneeland soils seldom exceed a depth of 24 inches, but in places they are as deep as 40 inches. Included in mapping are small areas of Kinman loam, Los Osos clay loam, and Steinbeck loam. This complex is used mainly for grazing. Capability unit VIIe-1; range site 12.

- Laughlin loam 50 to 75 percent slopes

  This soil is on very steep mountainous terrain of the Coast Range. Depth to sandstone or shale is between 20 and 30 inches. Included in mapping are small ares of Hugo very gravelly loam, Maymen gravelly sandy loam, Suther loam, and Yorkville clay loam. Also included are areas with a pale brown loam surface layer. Permeability is moderate in the subsoil of this Laughlin soil. Runoff is very rapid, and the hazard of erosion is very high. Fertility is moderately low. The available water capacity is about 3 to 4.5 inches. This soil is used mainly for range. Capability unit VIIe-8; range site 8.

- Laughlin loam, 30 to 50 percent slopes

  This soil is similar to Laughlin loam, 50 to 75 percent slopes. Included in mapping are small areas of Hugo very gravelly loam, Maymen gravelly sandy loam, and Suther loam. Runoff is rapid, and the hazard of erosion is high. This soil is used mainly for range. Capability unit VIe-8; range site 4.

- Maymen gravelly sandy loam, 30 to 50 percent slopes

  This steep soil is on mountainous uplands. The profile contains approximately 10 to 25 percent gravel, by volume, throughout. Depth to sandstone varies from 10 to 20 inches. Included in mapping are small areas of Henneke gravelly loam, Hugo very gravelly loam, Huse stony clay loam, and Los Gatos gravelly loam. Also included are some areas where slope is 75 percent, some eroded areas, and areas that have as much as 10 percent rock outcrop. Permeability is moderate in the subsoil of this Maymen soil. Runoff is rapid, and the hazard of erosion is high. Fertility is very low. The available water capacity is 1 to 2 inches. This soil is used mainly for watershed, for wildife browse and cover, and for limited range. Capability unit VIIe-8; range site 10.

- Riverwash

  Riverwash consists of very recent depositions of gravel, sand, and silt alluvium along major stream and their tributaries. Gravel bars make up the majority of these areas. During floods, alluvial areas are subject to repeated deposition, erosion, and shifting of transported material. Layering and gullying of soil and gravel brought from upstream areas has resulted. Riverwash provides gravel for commercial production, construction, and road fill. Capability unit VIIIw-4.

- Rock land

  Rock land consists of stony steep slopes and ridges that generally are in rough mountainous areas where there is little soil material. Small shrubs or an occasional stunted tree growing between lichen-covered rocks are the only vegetation. This land type is used mainly for watershed. Capability unit VIIIs-8.

- Rohnerville loam, 0 to 9 percent slopes

  This soil is along the coastal terraces from Gualala to Bodega Bay. Generally, it is nearly level, but where this soil is on a rise abutting the steep uplands adjacent to the terrace, it is gently sloping. Included in mapping are small areas of Baywood sandy loam, Kinman loam, Kneeland loam, and Noyo coarse sandy loam. Permeability is moderately slowin this Rohnerville soil. Runoff is slow to medium, and the hazard of erosion is slight to moderate. Fertility is moderate. The available water capacity is 4.5 to 8 inches. The soil is used mainly for sheep pasture and range. Capability unit IIIe-1; range site 1.

- Rohnerville loam, 9 to 15 percent slopes

  This soil is similar to Rohnerville loam, 0 to 9 percent slopes, but it is generally 30 to 40 inches deep to the substratum. In most areas this soil has slopes of 9 to 12 percent. Included in mapping are small areas of Kinman loam, Kneeland loam, and Noyo coarse sandy loam. Runoff is medium, and the hazard of erosion is moderate. The available water capacity is 4.5 to 7 inches. This soil is used mainly for pasture for sheep and a few dairy cattle. Capability unit IVe-1; range site 1.

- Sheridan course sandy loam, 2 to 30 percent slopes

  This gently sloping to moderately steep soil is on uplands. Most of the slopes are long and range from 7 to 15 percent. Bedrock is at a depth of 36 to 60 inches. Included in mapping are small areas of Baywood loamy sand and Dune land. Also included are areas that are 20 to 36 inches deep to the parent material. Permeability is moderately rapid in this Sheridan soil. Runoff is slow to rapid, and the hazard of erosion is slight to high. Fertility is moderate. The available water capacity is 3.5 to 7 inches. This soil is on Bodega Head and the coast where there is an ideal view of the ocean. It is used mainly for recreation. Capability unit VIe-4.

- Sobrante loam, 30 to 50 percent slopes

  This steep soil is on uplands. Depth to weathered greenstone ranges from 20 to 40 inches. Gravel content of shattered rock fragments varies from none to about 10 percent, by volume, because of irregular weathering of the parent bedrock. Included in mapping are small areas of Boomer loam, Goulding cobbly clay loam, Laughlin loam, and Suther loam. Although rock outcrops are characteristically associated with the landscape, they occupy less than 3 percent of the surface. Permeability is moderate in this Sobrante soil. Runoff is rapid, and the hazard of erosion is high. Fertility is moderate. The available water capacity is 3.5 to 8 inches. The soil is used mainly for range. Capability unit VIe-1; range site 4.

- Sobrante loam, 50 to 75 percent slopes

  This soil is similar to Sobrante loam, 30 to 50 percent slopes, but it is steeper. Soil depth ranges from 20 to 30 inches. Included in mapping are small areas of Boomer loam, Goulding cobbly clay loam, and Laughlin loam. Some areas are eroded, exposing the reddish-brown subsoil. Runoff is very rapid, and the hazard of erosion is very high. The available water capacity is 3.5 to 6 inches. This soil is mainly used for range. Capability unit VIIe-1; range site 8.

- Terrace Escarpments

  Terrace escarpments consist of long, narrow, rocky areas that rise abruptly from the mean tide line to the coastal plain terraces or plateaus. This land type consists of steep faces that separate the terraces from the lower lying land. The faces are composed of soft coastal sandstone, hard shale, or hard, weather-resistant, fine-grained sandstone. Vegetation is sparse and is made up of dwarfed shrubs, a few patches of grass, lichens, and moss. In seepage areas water grasses, a few cypress and oaks, and various weathered conifers also grow. Areas of Terrace escarpments are used mainly for watershed and as wildlife habitat. Capability unit VIIIs-8.

- Tidal Marsh

  Tidal marsh consists of nearly level marsh lands that are under water or extremely wet throughout the year. This miscellaneous land type occurs adjacent to San Pablo Bay and on narrow drainage-ways that empty into the Pacific Ocean. Except for small included areas that support limited grazing, tidal marsh has no farming value. It is used mainly for recreation and as wildlife habitat. Capability unit VIIIw-2.

- Yolo loam, overwash, 0 to 5 percent slopes

  This soil is similar to Yolo loam, 0 to 2 percent slopes, but because of its location where inundation and overflow are minor hazards, this soil stays wet for longer periods of time. Included in mapping are small areas of Cortina very gravelly loam, Pleasanton loam, and Zamora silty clay loam. Runoff is slow to medium, and the hazard of erosion is slight to moderate. This soil is used mainly for orchards, vineyards, row crops, and pastures. Capability unit IIw-2.

- Yolo sandy loam, overwash, 0 to 5 percent slopes

  This soil differs from Yolo loam, 0 to 2 percent slopes, in that its surface layer is sandy loam. This Yolo loam is subject to flooding and consequent deposition because of its topographic position along rivers and creeks. Included in mapping are small areas of Cortina very gravelly sandy loam, Pleasanton loam, and Zamora silty clay loam. Runoff is slow to medium, and the hazard of erosion is slight to moderate. The available water capacity is 8 to 10 inches. This soil is used mainly for orchards and vineyards. Some areas are used for pasture. Capability unit IIw-2.

- Yorkville clay loam, 5 to 30 percent slopes

  This moderately steep soil is on uplands. Generally, slopes range from 15 to 30 percent, and they are long and smooth. The subsoil may contain slickensides and variable amounts of rock fragments. Soil depth to rock ranges from 24 to 60 inches within short distances. Rock replaces the clay parent material. Included in mapping are small areas of Hugo loam, Josephine loam, Laughlin loam, and Suther loam. Permeability is very slow in the subsoil of this Yorkville soil. Runoff is medium to rapid, and the hazard of erosion is moderate to high. Fertility is moderately high. The available water capacity is 4 to 6 inches. This soil is subject to landslips and is used mainly for range. Capability unit VIe-3; range site 2.

- Yorkville clay loam, 30 to 50 percent slopes

  This soil is steeper than Yorkville clay loam, 5 to 30 percent slopes. Depth to bedrock ranges from 24 to 60 inches, but generally it occurs between 36 to 50 inches. Landslips and gullies are present. Included in mapping are small areas of Josephine loam, Laughlin loam, and Suther loam. Runoff is rapid, and the hazard of erosion is high. This

soil is used mainly for range. Other areas are used for wildlife cover and for watershed. Capability unit VIe-3; range site 6.

References

Natural Resources Conservation Service. 1972. *Soil Survey of Sonoma County, CA.* U.S. Department of Agriculture.

Summary of Soil Characteristics				
Soil Type	Permeability	Runoff	Erosion Hazard	Water Capacity (water-holding capacity)
Alluvial Land, Sandy	--	--	--	--
Atwell Clay Loam, 30-50 Percent Slopes	Slow	Rapid	High	9 to 11 inches
Baywood Loamy Sand, 2 to 9 Percent Slopes	Rapid	Slow	Moderate	4 to 5 inches
Coastal Beaches	--	--	--	--
Dune Land	--	--	--	--
Hugo Very Gravelly Loam, 30 to 50 Percent Slopes		Rapid	High	4 to 8 inches
Hugo Very Gravelly Loam, 50 to 75 Percent Slopes	Moderate	Very Rapid	Very High	4 to 8 inches
Hugo-Atwell Complex, 30 to 50 Percent Slopes	--	Rapid	High	4 to 7.5 inches
Josephine Loam, 9 to 30 Percent Slopes	--	Medium to Rapid	Moderate to High	6 to 10 inches
Kinman Loam, 15 to 30 Percent Slopes	--	Medium to Rapid	Moderate to High	6 to 10 inches
Kinman Loam, 30 to 50 Percent Slopes	--	Rapid	High	4.5 to 8 inches
Kinman-Kneeland Loams, 30 to 50 Percent Slopes	--	Rapid	High	4.5 to 7.5 inches
Kneeland Loam, 30 to 50 Percent Slopes.	--	Rapid	High	--
Kneeland Loam, 5 to 9 Percent Slopes.	Moderate	Slow	Slight	4 to 8 inches
Kneeland Rocky Complex, 30 to 75 Percent Slopes	--	Very Rapid	Very High	--
Laughlin Loam, 30 to 50 Percent Slope	--	Rapid	High	--
Laughlin Loam, 50 to 75 Percent Slope	Moderate	Very Rapid	Very High	3 to 4.5 inches

Summary of Soil Characteristics				
Soil Type	Permeability	Runoff	Erosion Hazard	Water Capacity (water-holding capacity)
Maymen Gravelly Sandy Loam, 30 to 50 Percent Slopes	Moderate	Rapid	High	1 to 2 inches
Riverwash	--	--	--	--
Rock Land	--	--	--	--
Rohnerville Loam, 0 to 9 Percent Slopes	Moderately Slow	Slow to Medium	Slight to Moderate	4.5 to 8 inches
Rohnerville Loam, 9 to 15 Percent Slopes	--	Medium	Moderate	4.5 to 7 inches
Sheridan Coarse Sandy Loam, 2 to 30 Percent Slope	Moderately Rapid	Slow to Rapid	Slight to High	3.5 to 7 inches
Sobrante Loam, 30 to 50 Percent Slope	Moderate	Rapid	High	3.5 to 8 inches
Sobrante Loam, 50 to 75 Percent Slope	--	Rapid	Very High	3.5 to 6 inches
Terrace Escarpments	--	--	--	--
Tidal Marshes	--	--	--	--
Water	--	--	--	--
Yolo Loam, Overwash, 0 to 5 Percent Slopes	--	Slow to Medium	Slight to Moderate	--
Yolo Sandy Loam, Overwash, 0 to 5 Percent Slopes	--	Slow to Medium	Slight to Moderate	8 to 10 inches
Yorkville Clay Loam, 30 to 50 Percent Slopes	--	Rapid	High	--
Yorkville Clay Loam, 5 to 30 Percent Slopes	Very Slow	Medium to Rapid	Moderate to High	4 to 6 inches